City of Cleveland
Frank G. Jackson, Mayor

Division of Engineering & Construction
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September 6, 2016

Myron S. Pakush, P.E.
District Deputy Director
Ohio Department of Transportation District 12
5500 Transportation Boulevard
Garfield Heights, Ohio 44125

Re: Willow Avenue Lift Bridge – Bearing Replacement
Emergency Type B Request

Dear Mr. Pakush,

The City of Cleveland has requested ODOT bid and administer an emergency Type B contract for the replacement of the northwest trunnion bearings on the Willow Avenue Lift Bridge. ODOT has also been requested to fund the project. The City would provide the design documents and the new bearings; a project share greater than 20%.The following is an account of the events related to northwest trunnion bearings since the problem was first identified.

On December 1, 2015 personnel from TranSystems and their mechanical subconsultant, Stafford Bandlow Engineering, were on site at the Willow Avenue Lift Bridge in Cleveland, Ohio to investigate noises that were noted to be emanating from the northwest counterweight sheave.

During this investigation, one inch of relative axial movement was noted between the trunnion shaft and the bearing housing at the northwest outboard bearing during operation of the bridge. While this bearing allows for some axial movement to accommodate deflection of the structure and thermal expansion or contraction, it is not intended to support the active axial movement that was observed. Additionally, a large amount of visible bronze wear particles were noted in the northwest outboard bearing's grease. The piston rings and the bearing cage are the only components made of bronze on the counterweight bearing; however, it could not be determined which of the two the wear particles came from.

Following this evaluation, the City of Cleveland was advised to cease operations of the bridge in order to prevent the failure of the bearings that would incapacitate the bridge to both vehicular and navigational traffic for an extended period of time.

As a result, an emergency, temporary repair was designed to limit the amount of axial movement at the northwest outboard counterweight sheave bearing until a new bearing could be manufactured and installed. The emergency repair was installed by City personnel on December 7, 2015 under the supervision of TranSystems and Stafford Bandlow allowing the bridge to return to operation on a limited basis. The cost associated with the emergency, temporary repair is $30,890.

Following the repair, the United States Coast Guard issued a notice to mariners that the bridge would only be opened once on weekdays and twice on weekends and federal holidays. Opening it more frequently was left to the City's discretion, but would not exceed four lifts in any given day. In conjunction with the limited lifts, the emergency repair must be monitored and lubricated on a weekly basis.

TranSystems' subsequent investigations of the inboard and outboard bearings at the northwest operating sheave, which included partial disassembly and grease analyses, revealed internal damage to both bearings and determined that the integrity of the bearings had been significantly compromised. In a report dated April 20, 2016, it was recommended that both bearings on the northwest operating sheave and the housings be replaced.

The Willow Lift Bridge is on the National Highway System (NHS) and the only roadway access for the Cargill Salt Mine, which is an irreplaceable supplier of road salt to local municipalities, counties, and ODOT. Additionally, the bridge is the only roadway access for Ontario Stone which supplies raw materials and Sand Products, Inc. which supplies 13 local foundries daily in Northeast Region. Commercial vessels rely on the bridge lifting in order to gain access to provide materials to the many factories located along the Old Cuyahoga River Channel.

Based on the above recommendation, the City determined the bearing replacement was emergency work. Therefore, the City executed emergency contracts simultaneously with TranSystems and Timken. TranSystems was retained to design the bearing replacement and provide construction engineering services for a fee of $191,000. On August 15, 2016 TranSytems submitted 30% plans in ODOT format. The preliminary estimate for the repair work is $880,000.

Timken is the sole source manufacturer. The original 1964 bearings, along with the 2002 replacement bearings for the northwest sheave, were manufactured by

Torrington. However, shortly after the manufacture of the replacement bearings in 2002, Torrington, along with all of their designs, were acquired by Timken. Because Timken possessed the shop drawings for the manufacturing of the bearing, it eliminated the additional time for design and engineering. Another manufacturer was contacted and reported a year lead time to design, engineer, and deliver the bearing, which was double the 26 week lead time Timken quoted to deliver the bearing to the site. Timken was issued an emergency purchase order to manufacture the bearings at a cost of $310,000.

Timken's production schedule shows that the bearing will be delivered during the week of November 18, 2016. The schedule is reviewed on a bi-weekly basis. Each update confirms that Timken is on schedule to meet its commitment.

Recently, Timken was asked to certify that the bearings meet the "Buy America" requirements. They responded that they could not do so. Timken reported that the housings are manufactured in Canada while the bearings are manufactured in the U.S. using U.S. and German materials. The housing and the bearing are assembled in the U.S.

As noted earlier, Timken was selected to manufacture the bearings and housing because they had the design plans which cut the manufacturing time in half. Given the emergency nature of the repair and dire economic consequence associated with the bridge failing, Timken was selected. They were not asked if the bearings would meet the "Buy America" requirements. It is the City's understanding that a review and approval by FHWA is required to incorporate these bearings in a federally funded project.

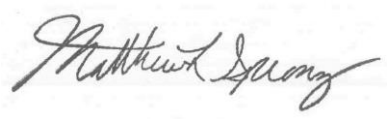
The City had originally intended to make the repair on its own. Emergency funding was requested from OPWC but their fiscal year's allotment was committed elsewhere. NOACA funding was also looked at, but the agency is fiscally constrained and thus a request was not made. Nevertheless, the City moved forward as funds were put in place for the design and the bearings. In August 2016, OPWC was once again approached about emergency funding as their fiscal year had just commenced and funds were now available. Given that they have less than $3 million available and the bearing would utilize almost a third of that amount, OPWC indicated that they would not participate.

On August 6, 2016 the City requested that ODOT determine if the repairs would qualify for FHWA funding as a Type B Emergency contract. The City also asked that ODOT bid, award and administer the contract. After several discussions, ODOT determined that the project met the requirements for a Type B contract, but a funding source would need to be identified.

In anticipation of the project being administered by ODOT, TranSystems was instructed to carry their design to the 100% mark on September 30, 2016. The submission of final plans to Central Office on October 3, 2016 would result in a contractor being on board to accept the delivery of the bearings in late November 2016. This would then lead to the repair being performed in January 2017 while the river shut down is in place. This is the schedule that given to the United States Coast Guard and which they fully expect. Deviation from this schedule could result in daily fines of $25,000.

The City appreciates ODOT's continued support of this project and given the consequences of the temporary bearing repair failing prior to installation of the new bearings, we trust that ODOT will be able to affect the repairs as an Emergency Type B project.

Sincerely,



Matthew L. Spronz, P.E., Director
Mayor's Office of Capital Projects

Cc: Richard J. Switalski, P.E., Admin. Bureau Manager, E&C
Tom Boyer, P.E., Section Chief, E&C
Larry Ho, P.E., Consulting Engineer, E&C
Randall S. Over, P.E., ODOT
Lou Hazapis, P.E., Planning & Engineering Administrator, ODOT-District 12
Greg Kronstain, Construction Administrator, ODOT-District 12

Historical Structure Impacts Delineation

Map F.1 – Ohio History Connection Online Map

Mapping Website: https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping

Map F.2 – Historic Sites and Proposed Alternatives

Mapping Website: https://www.ohiohistory.org/preserve/state-historic-preservation-office/mapping

- The red hatched region indicates the “Ohio City Preservation District”.
- The historical sites are depicted with red dots numbered 1 through 7.
  - Historic Site 1 – Erie Railroad Cleveland Powerhouse
  - Historic Site 2 – Division Avenue Pumping Station
  - Historic Site 3 – Federal Knitting Mills
  - Historic Site 4 – Vitrolite Building
  - Historic Site 5 – Van Rooy Coffee Company Building
  - Historic Site 6 – Globe Iron Works Building
  - Historic Site 7 – Pennsylvania Railway Ore Dock (Delisted)

Note: there is one red dot crossed but has recently been delisted from the list of historic sites.

Demographic Data

Census Tract ID (39 035...)	Demographic Percentages within Census Tracts[1]				Average (%)
	% Minority	% Low Income	% Linguistic Isolation	% 64yrs or older	
1036.02	22	53	0	15	22.5
1031.00	45	68	7	4	31
1033.00	71	68	5	3	36.75
1012.00	40	69	20	24	38.25

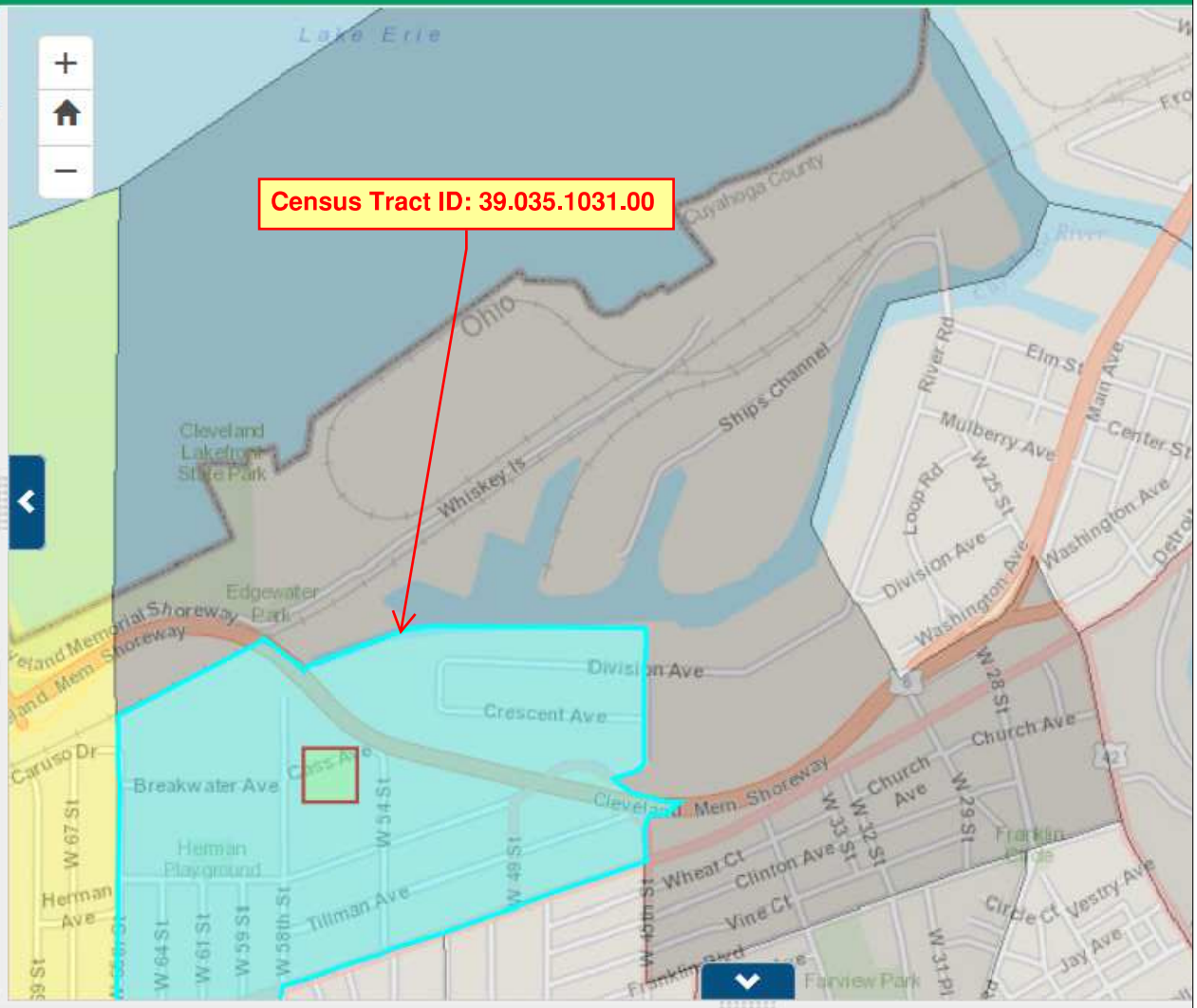
[1]Demographic percentages for each Census Tract is from the Transportation Information Mapping Systems (TIMS) website [https://gis.dot.state.oh.us/tims] and attached maps.

gis.dot.state.oh.us/tims/Map/Environmental

TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

Project Search | Create a Map | Data Download | Standard PDF Maps | Map Viewers | Data Glossary

B_PM25_D6	8
B_PM25_B2	7
B_PM25_B6	7
B_PM25_P2	9
B_PM25_P6	9
% minority	45% (64%ile)
% low income	68% (92%ile)
% linguistic isolation	7% (78%ile)
% less than high school	18% (74%ile)
% under age 5	5% (40%ile)
% over age 64	4% (6%ile)
Demographic Index	56% (79%ile)
Supplementary Demographic Index	25% (75%ile)
Lead Paint	0.92 = fraction pre-1960 (97%ile)
EJ Index: Lead Paint Indicator (%ile)	91%ile
EJ Index with Supplementary	88%ile



Results

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gis.dot.state.oh.us/tims/Map/Environmental

TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

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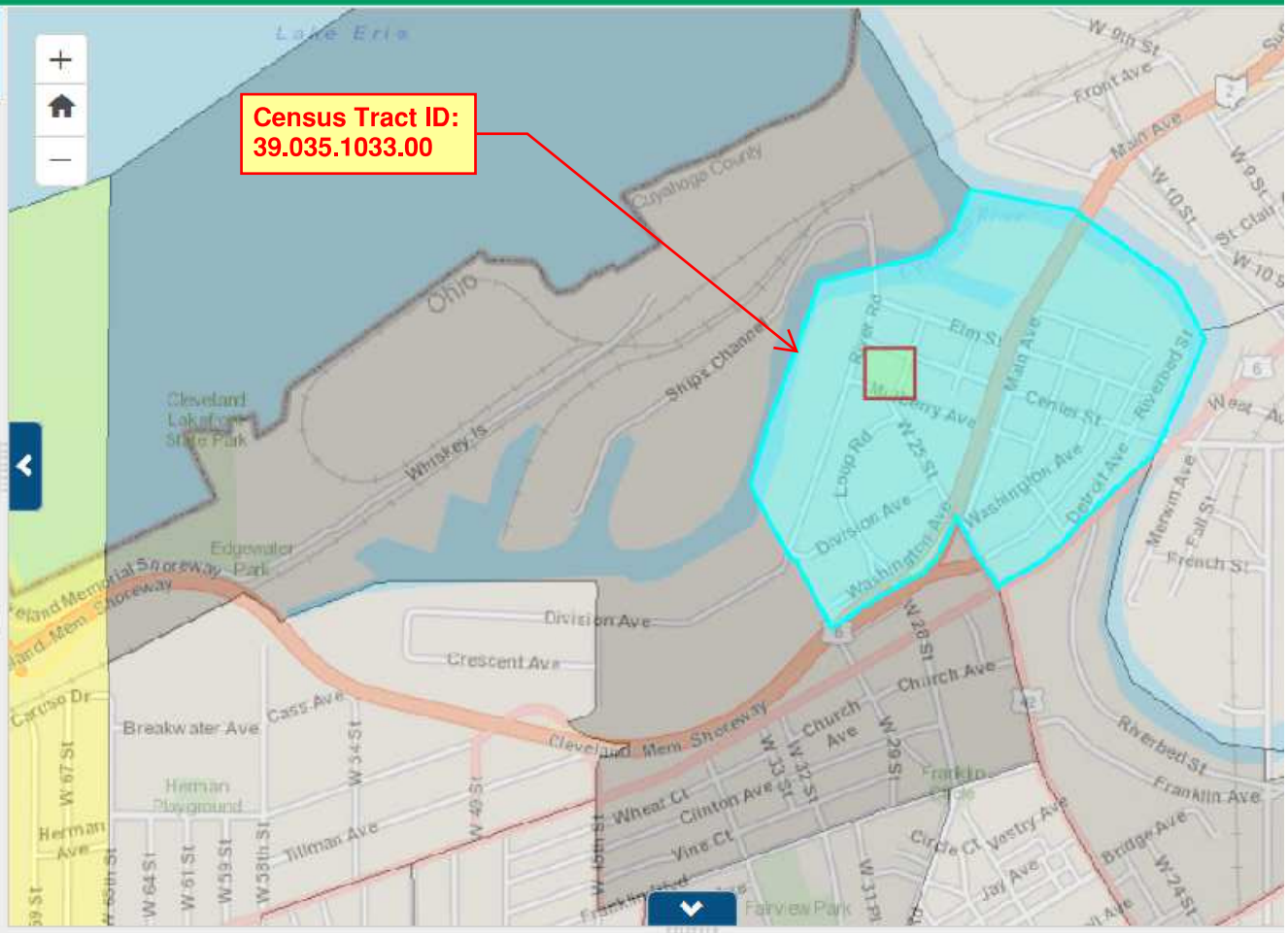
B_PM25_D6	10
B_PM25_B2	10
B_PM25_B6	10
B_PM25_P2	10
B_PM25_P6	10
% minority	71% (79%ile)
% low income	68% (92%ile)
% linguistic isolation	5% (72%ile)
% less than high school	15% (67%ile)
% under age 5	13% (95%ile)
% over age 64	3% (4%ile)
Demographic Index	69% (88%ile)
Supplementary Demographic Index	29% (84%ile)
Lead Paint	0.31 = fraction pre-1960 (62%ile)
EJ Index: Lead Paint Indicator (%ile)	92%ile
EJ Index with Supplementary	90%ile



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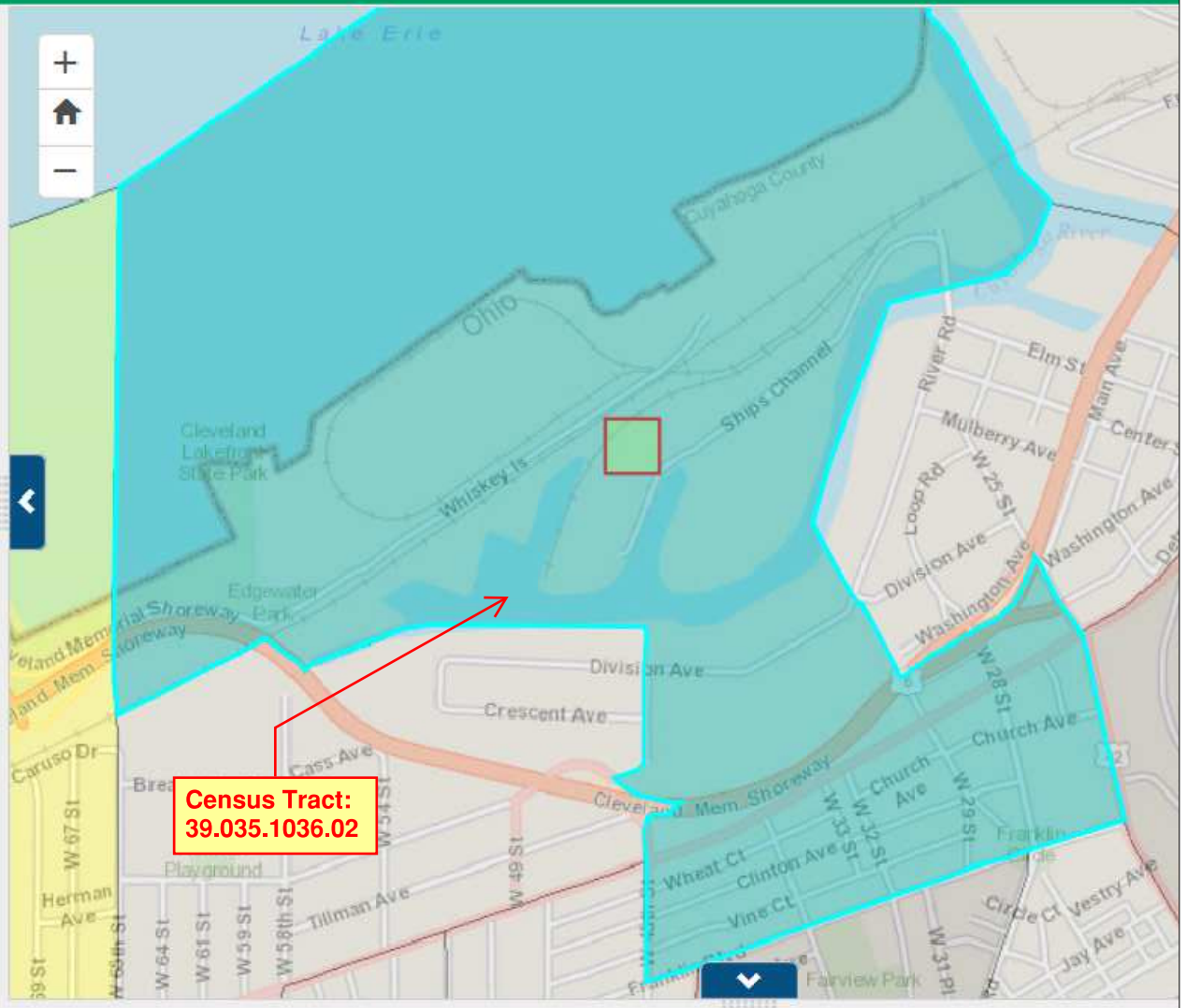
TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

Project Search | Create a Map | Data Download | Standard PDF Maps | Map Viewers | Data Glossary

B_PM25_D6	6
B_PM25_B2	5
B_PM25_B6	5
B_PM25_P2	8
B_PM25_P6	8
% minority	22% (41%ile)
% low income	53% (80%ile)
% linguistic isolation	0% (44%ile)
% less than high school	20% (77%ile)
% under age 5	1% (5%ile)
% over age 64	15% (60%ile)
Demographic Index	37% (60%ile)
Supplementary Demographic Index	18% (59%ile)
Lead Paint	0.64 = fraction pre-1960 (84%ile)
EJ Index: Lead Paint Indicator (%ile)	68%ile
EJ Index with Supplementary	63%ile



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